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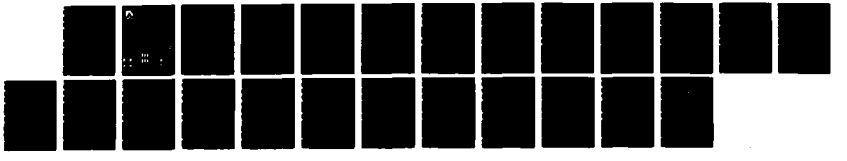

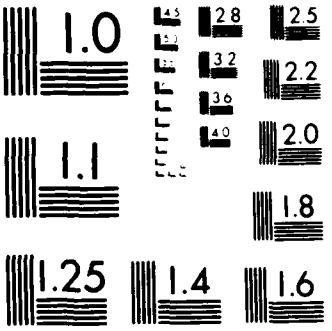

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RESEARCH REPORT

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VISUALIZATION: THE KEY FOR TOMORROW'S AIR FORCE LEADERS

By LIEUTENANT COLONEL CARL LOVELAND

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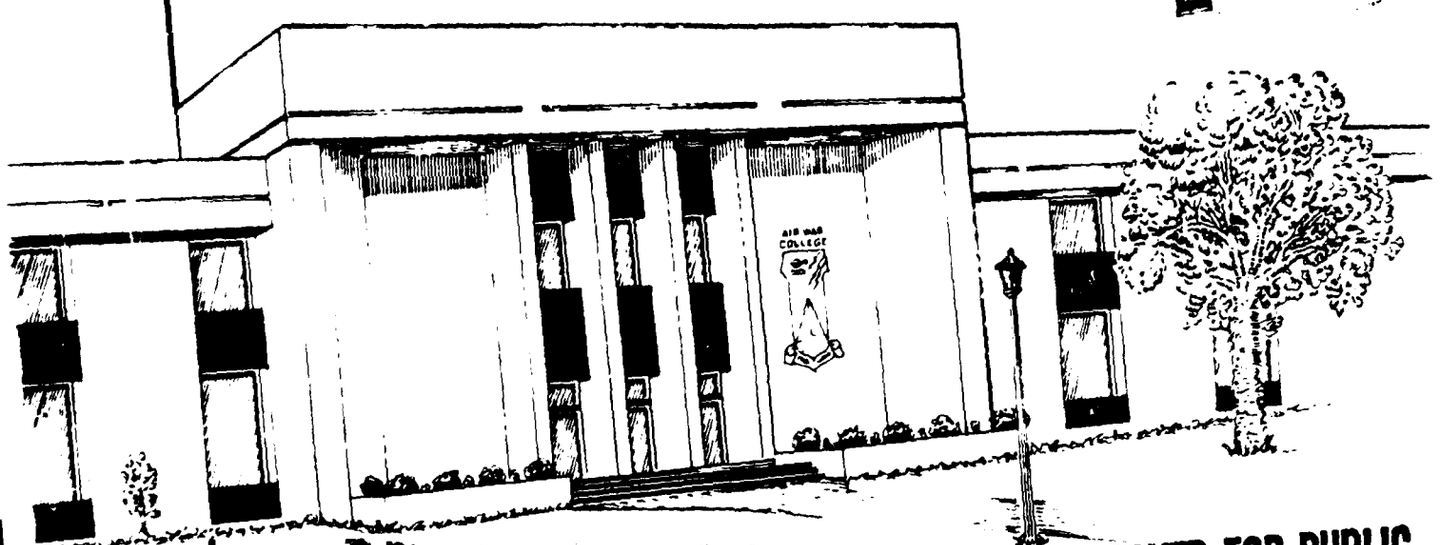

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VISUALIZATION:

THE KEY FOR TOMORROW'S AIR FORCE LEADERS

by
Carl Loveland
Lieutenant Colonel, USAF

A RESEARCH REPORT SUBMITTED TO THE FACULTY

IN

FULFILLMENT OF THE RESEARCH

REQUIREMENTS

Research Advisor: Lieutenant Colonel David Young

Maxwell Air Force Base, Alabama
March 1987

TABLE OF CONTENTS

SECTION		PAGE
	Disclaimer-Abstainer	iii
	Abstract	iv
	Biographical Sketch	v
	Preface	vi
I.	THE PROPOSAL	1
II.	THE DATA	4
III.	THE POSSIBILITIES	10
	NOTES	15
	BIBLIOGRAPHY	16

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AIR WAR COLLEGE RESEARCH PAPER ABSTRACT

Title: Visualization: The key for tomorrow's Air Force leaders

Author: Carl Loveland, Lieutenant Colonel, USAF

The current generation of Air Force leaders, almost exclusively, use the left portion of the human brain to solve problems that face them. This side of the brain is logical, analytical and uses words as a medium with which to function. The challenges of the 21st century are much more complex and rapidly changing. One of the keys that could help us all meet the challenges is the more effective use of the right side of the human brain--the side which uses visualization or imagining as a means to solve problems.

BIOGRAPHICAL SKETCH

Lieutenant Colonel Carl L. Loveland came to the Air War College in August 1986 from his position as Assistant Director of Operations, 10th Tactical Reconnaissance Wing, Royal Air Force Alconbury, England. His operational expertise in the Air Force is tactical reconnaissance. He has served in that field since graduation from Undergraduate Pilot Training in 1971. Additionally, Colonel Loveland has served tours of duty in the Tactical Air Control System and the Directorate of Plans on the Air Staff. Colonel Loveland is a graduate of Squadron Officers School, Air Command and Staff College and the Air War College.

PREFACE

This paper is intended to be a vehicle to introduce the reader to the issue of visualization and its potential for the future. Much research is currently being done on the most complex thing in this universe--the human brain. As this increased understanding of the human brain unfolds, quantum leaps in education, sociology, and management will result. I urge you to conduct your own personal research in this area for maximum personal benefit.

THE PROPOSAL

What If: I could become a better pilot by simply thinking about it.

What If: I could develop a better supply system by daydreaming about it.

What If: I could do anything in the Air Force I wanted to through the effective use of pictures--mental pictures.

The human brain is the most complex device on earth. It has 10 billion neurons (cells that send electrical impulses).[1] Here are a few "bullets" about the brain to start you thinking about its capacity, how we use it and its potential

- The "software" of the brain is programmed to evolve and grow as we use the brain more.
- Each set of "software" is different as each individual on earth--not like LOTUS 1-2-3 or WORDSTAR which are identical.
- The brain does not come with an instruction manual on how to use. Each of us must learn about our own mental capabilities.
- So far, no human has ever been able to improve on the brain. They have only been able to improve the way we use its existing capabilities.
- The mind is the only permanent frontier, the leading edge of our steadily-arriving future.[2]
- The human brain weighs approximately 3 1/2 pounds.
- It has the ability to receive and store 1,000 bits of new information every second of life and still have excess capacity.

- A bumblebee has a brain the size of a grain of salt and is able to do a very wide range of functions including flying, etc. The human brain is 10 million times the physical size of the bee's brain and several billion times more complex. What are the limits of its capacity?[3]

These are but a few of the thoughts that jump out at a student when he/she begins to research the brain and its potential.

The single concept about the mind that first caught my attention in 1977 was the "AS IF" principle. This principle simply stated says that all one has to do to get something/anything (promotion, winning baseball team, etc.) is to begin to think "AS IF" the event has already happened. Once a person visualizes the event in all of its aspects (mental, emotional, physical), the mind takes over and through subconscious action begins the process to enable the event to occur, just as it was visualized.

This process can be simply expressed but it is not quite that easy to put into practice. The keys are being able to see the event in every detail and having the definiteness of purpose not to lose sight of the event. An excellent example of this process is learning "how to fly" the final turn in Undergraduate Pilot Training. Many hours and several thousands of dollars are spent teaching each student pilot trying to create in his mind an image of how the final turn in the overhead jet traffic pattern should look and feel like. Once this image of a proper traffic pattern is implanted in the mind of the student pilot, he/she then attempts on every traffic pattern to match this image that

has been created in the image portion of the brain. If the student can never visualize this event (final turn) in his/her mind, successful completion of GPT is impossible.

The human brain is very much like an iceberg. The typical human uses only about 10% of its capacity.[4] Much like the iceberg, there is much below the surface of the normal brain functions that, if used properly, could make quantum leaps in our human understanding and the level of quality of life on earth.

THE DATA

The human brain has become one of the most studied objects in science today. Psychologists and neurophysiologists are generating over 500,000 scientific papers each year. Chemists are studying the 100,000 different chemical reactions that occur in the brain every second.[1] Brain research is truly a case of "the more you know of a subject, the more you discover what you do not know."

The brain is a double organ consisting of two identical-looking hemispheres joined together by several nerve fibers called *corpus collosum* (see Figure 1).

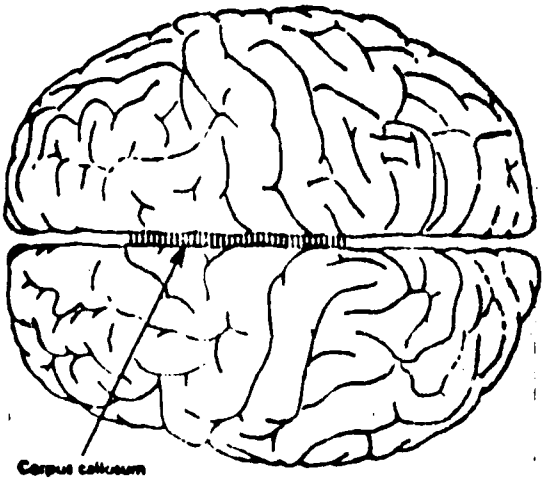
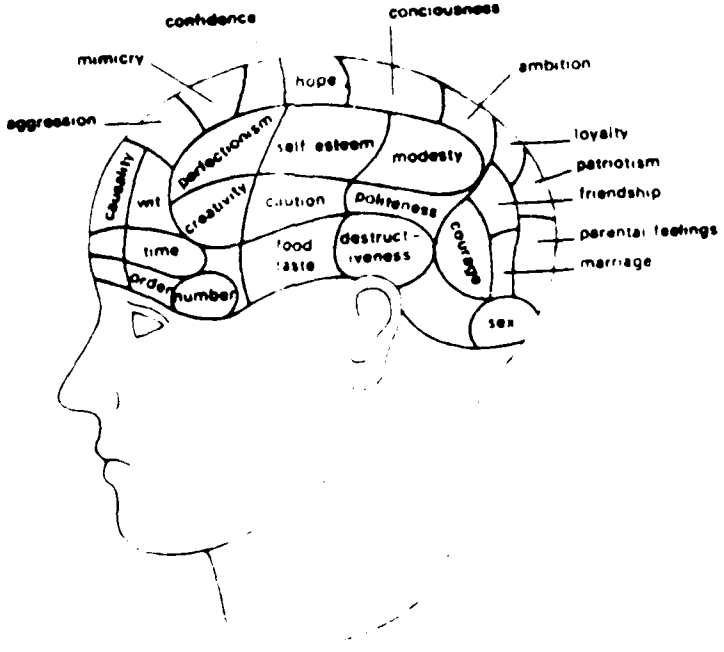


Figure 1.

Within these two hemispheres, areas of specialization can be located that provide specific capabilities for the body. The

left hemisphere is the "language specialist." It "thinks" and "operates" through the medium [illegible] for the computer expert in words; it excels at the sequential activities of humans such as mathematics, language, logic, etc.

The mode of operation for the right half of the brain seems to be different. It deals in images and works problems in parallel, not sequentially like the left half of the brain. The right side of the brain would see a face in a crowd and analyze the entire image of the face at one time while the left half of the brain would compare specific features of the brain one at a time. Since "a picture is worth a thousand words," the right brain approach to a problem or situation is much faster, less easily fooled by missing or altered details. The mapping of the brain's functions is not yet an exact science by no means. The following two figures show two "maps" of the brain from the same text. From the descriptions, one begins to get a feeling for the complexity of this object that does so many things for us--the human brain.



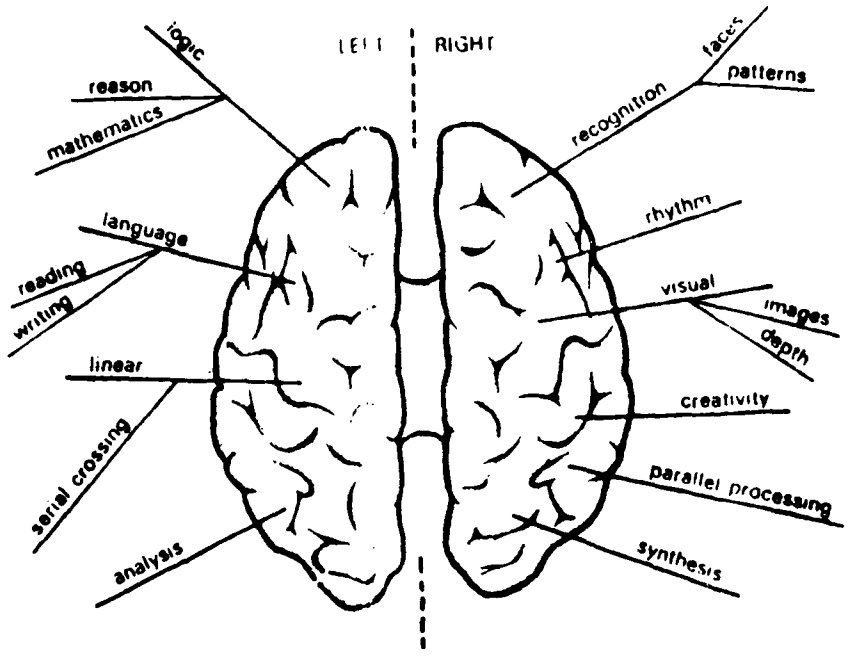


Figure 3.

The two hemispheres of the human brain develop a "working relationship" with each other to enable us to function as we know it today. The left half of our brain balances the checkbook each month while the right half helps us remember vividly the day we got married or won that "special" baseball game in Little League. The components of the brain work together and separately. In some medical situations, it is now common practice to disconnect the two halves of the brain. This situation has shown researchers how the two hemispheres act independently. In this situation, a person may be blindfolded and asked to pick up a pencil with the right hand and would not be able to tell you what it is unless he/she could see it.

Another entire method to study the mind is based not upon the physical makeup of the mind (left and right hemispheres) but rather the conscious level of the mind. Many of the things we do

at the conscious level of thought, but many other things are done at the subsconcious level. For example, did you consciously think about walking today? No, "we just do it." The subconscious mind is like a group of subroutines in a computer program that do much of the work without us ever consciously thinking about them.

Some current thinking is that the right side of the brain programs the subconscious mind through the use of images. How do you teach your child to play baseball or ride a bike? You say, "watch this." That child then has an image that is being programmed into the subconscious mind of what that task should look like. Any physical task such as riding a bicycle is an extremely complex act requiring a knowledge of physics, balance, and on and on. Once the image is finally programmed at the subconscious level, it is locked into memory and never lost. The only way to "forget" how to ride a bicycle is to lose access to that portion of the brain where the information is stored.

Tim Gallvey has popularized this concept of programming the mind at the subconscious level through his book, The Inner Game of Tennis. Many very smart left-brain people are totally inept at such things as sports or dancing. The classic left-brain approach to learning to do something like tennis or dancing is to buy a book on the subject and learn the "steps" as a descrete sequence of events. The ideal learning devise would be a series of painted footsteps on the floor, each numbered in order. The

result--a bunch of bad dancing and tennis-playing lawyers and engineers.

The right brain solution to this same problem would be to teach both verbally and visually. The verbal description pacifies the left brain and allows the right brain to then become dominant and learn through the use of imagery, how it looks and feels.

Intuition is a word we use today for those ideas we have that can't be explained in any other way. Today it is believed that the subconscious mind works at the same pace 24 hours a day, 7 days a week, 365 days a year without rest. Some researchers argue that intuition is really ideas that surface from the subconscious level of the mind, day or night, whenever the subconscious mind has completed solving a problem that is has been working.

The question then becomes: How does an individual make more effective use of the subconscious mind? After all, if this portion of the mind never rests and has almost infinite capacity--imagine the possibilities.

The mind has vast capabilities that we humans intentionally limit. At the base of the brain near where the brain is connected to the central nervous system there is a function called the reticular activation system. It acts like an oil filter in your car but in the human body it serves to stop sensory inputs of the nervous system from reaching the brain and confusing or distracting the decision making process. A good

example of how this system works is the process to purchase a new car. New cars are being advertised every day of every year in hundreds of advertisements that you and I come in contact with. Our mind is capable of accepting that data but is prevented from doing so by the reticular activating system.[4] Once we consciously remove the portion of the mental filter that prevents this data from reaching our brain we begin to "see" all kinds of automobile advertising that was there all along but we didn't "see" it. These mental filters can be in several forms.

Education filters may prevent us from "seeing" the beauty in a certain art form. Emotional filters may prevent us from "seeing" the view of another human of a different ethnic background. Professional filters may prevent us from "seeing" the point of view of the other services.

What can be done to increase our effectiveness in using this thing we call our brain? What if the scientists are correct and we are currently using only 10% of the brain's capacity?[5] What if we can somehow make only a 2% improvement in our ability to use our brain? Some say Einstein only used 12% of his brain--look what he was able to conceptualize. Look at the problems he was able to solve. What current problems could we solve?

THE POSSIBILITIES

Let's imagine together for a few moments what are the possibilities. What if, through more effective use of imagery and exercise of the subconscious mind, we could accomplish virtually anything we desire? How would this work?

The first and hardest thing to is decide what is to be accomplished. Do you want to neutralize Soviet missiles? Do you want a promotion? Do you want a better relationship with your family? Do you want a certain job? Do you want to lose 10 pounds? You continue the list.

Let me offer three practical examples of how the AS IF principle works in practical experience. The examples are:

1. Promotions
2. Flying Time Management - 1985
3. "Together" Wing

Promotions. I submit that the critical factor that determines how high an officer goes in rank within the Air Force is how high he thinks he should go. By this I mean if an officer at an early stage spends the time to use the AS IF principle and determines what rank he desires to reach during his Air Force career, that is the most important thing/event which occurs toward him reaching that goal. Once an officer decides to be a colonel, general, or whatever the rank, he then must see himself

as wearing that rank today. After that is done, with clarity, the person begins to more closely observe officers of the desired rank. He sees how they think, how they dress, how their shoes are shined, how their hair is cut, how they make decisions, what jobs they have held, what degrees they have, what they read, how they manage their time each day, how they relax; in short, everything about them in minute detail. This exact total picture is repeated, over and over and over. This picture need not be of one individual. It may be a composite of several people. You simply take the best qualities from each role model and form a composite role model. This individual composite becomes a pacesetter by which you measure your progress toward this goal of a certain level of promotion. Regular measurement against the pacesetter is vital if the goal is to be attained. World class milers have adopted this technique when world record attempts are made. You will see a very fast pacesetter or "rabbit" also enters the mile competition. This pacesetter invariably leads the pack for a specified distance. This is usually 1/2 mile or slightly more. He job is to set an exact pace for the other runners. The other runners match his pace rather than setting the pace from the very start of the race.

In the military, find a pacesetter and observe closely. Watch his pace while always looking for a new pacesetter.

Talk to the vast majority of senior officers on this issue privately and I submit you will find that they "knew" they would get to the high rank for many years previously.

Flying Time Management - 1985. I commanded a tactical flying squadron at the end of the 1985 fiscal year. The goal I had set was to complete the year and simultaneously zero out flying hours and flying time. Great plan, but as the fall approached, I was tasked with two large-scale developments that stretched the unit across 1,000 miles and several locations. The problem--how to meet this precise goal. The vehicle used was the AS IF principle. I thought well ahead of the problem and began to visualize exactly how the complex orchestration could be accomplished in every detail: what guidance was required from me, who to give the guidance to, what communication systems were required, what feedback systems were required, what accounting systems were required, etc., etc. I played this "video" in my mind over and over and matched it against the pacesetter I had developed--a detailed accounting system. The result: 0/0.

Together" Wing. How, as a Wing Commander, do you get the job done with efficiency, high morale and maintain combat effectiveness? I have seen it done very effectively using the AS IF principle time and time again. Those commanders who have the vision to define their goal for their wing get the job done--those who don't clearly define the goal fail. The principle is the same as the flying time management example only on a different scale. It is the first job of a wing commander to define the wing's goal--what is our mission? Then he must see exactly how he wants every component of that wing to work toward that goal. The more clear his picture, the better he is able to

convey that image of mission accomplishment to his people. The image he projects of the goal must be dominant. He must keep the goal out front for the people to be able to measure their performance against his standard, the pacesetter if you will.

If the wing commander's goal is clearly visualized and projected to his people the goal begins to enter sub-conscious actions throughout the base. The INTRO program effectively welcomes newcomers, the customer service representatives begin to truly serve their customers, the supervisors are concerned with mission accomplishment, the job gets done on time every time. The result: a superior wing.

I am not saying this AS IF concept is painless. It requires much thought, vision, introspection, study, personal interaction and hard work to make it work. The magic thing is that we all have the natural capacity to do it.

As leaders of tomorrow's Air Force, we are charged with the responsibilities to have vision and lead the United States into the 21st century. As leaders, we must take the time to imagine what challenges lie ahead and then shape our organizations and people to meet these challenges.

One of the best current examples of the teaching of image teaching is using high technology simulators to teach "the final turn" to student pilots. In the past, we talked about it on the ground and spent hour after hour verbally talking about it in the air. Today we are in the infancy stage of simulators with optical presentations to allow the student to "see and feel a

perfect final turn, then practice it based on this near perfect mental image we give him. These simulations are getting better every day. Tomorrow machine-generated imagery will be indistinguishable from real life and our pilots will be better than ever for it. But, what other applications do we have personally for the same concept--set your goal, establish a perfect image of your goal, see it and feel it in perfect detail, then train the subconscious mind to do the work effortlessly.

I submit the potential for this concept is as limitless as our mind. Whether the objective is to fly a final turn, lose 10 pounds, or neutralize Soviet missiles, the same principles apply. Our job is to do the hard work to determine what our personal and professional goals should be, then precisely define these goals with picture perfect clarity and watch our mind produce solutions to our goals in priority order.

NOTES

THE PROPOSAL

[1] Robert W. Finkel, The Brain Booster, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1983, p. 128.

[2] Jules Z. Willing, The Living Mind, William Morrow & Company, Inc., New York, 1982, p. 55

[3] Peter Russell, The Brain Book, Hawthorne Books, Inc., New York, 1979, p. 3.

[4] Ibid, p. 7.

THE DATA

[1] The Brain Book, p. 18.

[2] Thomas R. Blakeslee, The Right Brain, Anchor Press/Doubleday, Garden City, NY, 1980, p. 5.

[3] The Brain Book, pp. 18, 54.

[4] Ibid, p. 211.

[5] Robert Collier, The Secret of the Ages, Collier Book Corp., Ramsey, NY, 1975, INTRO.

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